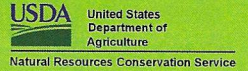


Insect Pollinators

Habitat Management for WV Wildlife



Who are West Virginia's pollinators?

West Virginia's insect pollinators include bees, butterflies, and moths as well as wasps, flies, beetles, and ants. While the non-native, European honey bee (the bee managed by beekeepers) is the most common crop pollinator in the US, native bees, such as bumble bees, mining bees, carpenter bees, long-horned bees, squash bees, and sweat bees are also critical. These native bees are often specialized for foraging on the flowers of native plant species and specific crops resulting in more efficient and effective pollination, and in the production of larger and more abundant fruit.

Why protect pollinators?

Since three-fourths of the world's flowering plants require animal pollination to reproduce, without pollinators, our landscape and our diets would be far less diverse and our food prices would skyrocket. Insect pollination also accounts for between \$18 and \$27 billion in crop production value in the United States annually.

Our pollinators have declined due to habitat loss, use of pesticides, invasive species, climate change, pathogens and diseases, among other factors. Managed colonies of European honey bees have suffered a 50-percent decline in recent decades, with approximately one in three hives being lost each winter between 2006 and 2014. At least 25% of our North American bumble bee species are at risk of extinction, and with them could go our tomatoes, peppers, cranberries, blueberries and other crops

that rely on buzz pollination (a specialized pollination behavior honey bees cannot perform) for optimum fruit set. More than 17 percent of our North American butterflies face extinction as well, with our beloved Monarch Butterfly in particular peril since its populations have plummeted by about 90 percent in the last two decades.

When their habitat needs are met, the nearly 4,000 species of wild native bees in North America make significant contributions to crop pollination on farms. In some cases studied, such as squash production in New Jersey, native bees provided 100 percent of the necessary pollination. As securing hives of European honey bees for crop pollination becomes more difficult and expensive, protecting and restoring habitat for native bees becomes even more important. This habitat, full of diverse nectar resources and free from pesticides, is also critical for helping to support local beehives, native butterflies, and a myriad of beneficial insects.



*Native bees, such as this blue orchard bee (*Osmia lignaria*) have been shown to be the most efficient pollinators of certain crops, like apples, which require only 250 female blue orchard bees per acre to achieve effective pollination, but would need 15,000 to 20,000 honey bees to accomplish the same feat.*

How Can West Virginians help Pollinators?

While the specific habitat needs of the many species of WV pollinators depend on the species' life history and the time of year, there are basic habitat requirements all insect pollinators share. Pollinators need 1– protection from pesticides, 2– diverse flowering plants that provide pollen and nectar resources for adult pollinators throughout the growing season, and 3– habitat for nesting, larval development, and overwintering.

Reduce or eliminate pesticide use

Pesticides are one of the major threats to healthy pollinator populations. Insecticides can kill pollinators outright, especially when they are applied in a prophylactic fashion. Herbicides, which can be a useful tool for eliminating invasive plants and grasses that outcompete native wildflowers, can also destroy the nesting, larval, and overwintering habitats pollinators need, as well as native plants that provide excellent nectar and pollen resources. Instead of turning first to chemicals to control pest plants and insects, land managers should consider integrated pest management (IPM). IPM is a strategy that employs 3-phases to address pest problems: 1) Use cultural practices to prevent pests; 2) take the time to monitor and identify any pests that occur; 3) use pest controls (chemical or non) only when a certain threshold of pest activity is reached.

When, after exhausting other options, pesticides are used, follow the label guidelines closely and use application methods that minimize damage to pollinator populations. These can include spraying at night, never spraying when plants are blooming or on windy days, mowing or removing flowering weeds from fields before spraying crops to remove the pollinator attractants, and spraying chemicals that are specific to the pest instead of using broad-spectrum

pesticides. Whenever pests become an issue, always ask your county Extension Agent for the approach that will be least harmful to pollinators.

Provide foraging habitat for adult pollinators

One of the most attractive and effective ways to increase pollinator populations on your property is to nurture a variety of flowering plants that will provide nectar and pollen to adult pollinators. To best help pollinators, a landscape of diverse plants is optimal and should range in height, flower shape and flower color, with successive blooms that provide forage throughout the growing season. Consider your space, your existing plants, and the potential flowering plants in your seed bank when you develop your pollinator areas. Realize that pollinator foraging habitat can be a small, well-planned butterfly garden, a large bee meadow filled with native wildflowers, a fencerow with various layers of flowering trees, shrubs and forbs, or even pollinator-friendly field borders and cover-crops. Simply changing your mowing habits to allow marginal lands, fencerows and ditches to revert back to some native vegetation such as asters, goldenrods and milkweeds will dramatically improve the nectar resources on your property and promote pollinators as well as other beneficial insects that make up a healthy landscape.

A monarch caterpillar munches on milkweed, the only host plant for eggs and larvae of our state butterfly.



Create or enhance habitat for pollinator nesting, larval development and overwintering

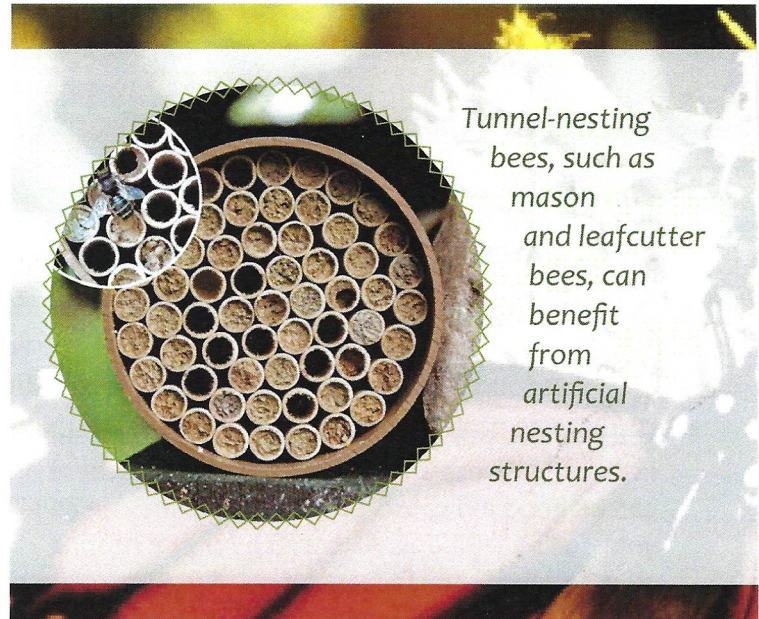
While the various species of pollinators have dramatically different life histories, providing nesting, egg-laying, pupating and overwintering habitats for most species is not a difficult task if you always keep diversity in mind. Providing a species-rich foraging area with “untidy” adjacent areas will also provide the refuge most WV pollinators require to complete their life cycle and to overwinter safely.

The majority (about 70 percent) of our native bees are solitary ground-nesters. These species need bare patches of undisturbed sandy or loamy soil in which to excavate their nests. Avoid mulching and tilling these areas to prevent nest disturbance. Additionally, since landscape cloth and plastic sheeting prevent ground nesting, avoiding these weed barriers will help promote the largest number of our native bees.

About 30 percent of our native bees are solitary cavity or tunnel-nesters, using pithy stems of vegetation or insect tunnels under tree bark to create their nests. Allow old snags and downed trees to remain on your landscape and refrain from “cleaning up” your marginal lands and fence rows. Instead leave pithy stems such as teasels, reeds, bamboo, blackberry, etc. that tunnel-nesting bees can use for egg-laying sites.

Bumble bees are a critical type of native bee for crop production, largely due to their ability to buzz-pollinate important WV crops. Bumble bees use old rodent burrows, clumps of bunch grasses, brush and rock piles as sites for their single-year colony nests. These types of habitats are also valuable to many other beneficial insects and pollinators as sheltering and overwintering sites.

Habitat Management for WV Wildlife



Tunnel-nesting bees, such as mason and leafcutter bees, can benefit from artificial nesting structures.

Most of our native butterflies, which change from caterpillars to flying adults through a process known as metamorphosis, require host plant species for their caterpillars to eat before changing into butterflies. Planting and protecting these plant species will provide critical habitat for these butterflies and provide nectar resources for other pollinators when these plants are in bloom. Since Monarch butterflies are in danger of extinction, planting, promoting, and allowing various species of milkweed (*Asclepias* spp), the Monarch’s only host plant, on your landscape could mean the difference in the survival of this species.





Attracting Pollinators

To provide pollinator habitat, begin by evaluating the current habitat. Try not mowing your landscape for several weeks or months, then note what blooms appear and also where you see pollinators. This will change throughout the year as native flowers have varying bloom periods. You can also pay attention to the flowers you see in marginal areas and along fence rows, as these can be good indicators of what plants may be in your soil's seed bank. Also watch for bee nesting sites and for butterfly host plants. Once you have identified pollinator habitat on your property, take steps to protect what already exists. Refrain from mowing nectar plants and removing nesting sites for tunnel-nesting bees, as well as tilling or disturbing sites where ground-nesting bees are present. Simply deciding you prefer "messy" pollinator habitat to a neatly mowed fencerow or roadside ditch can dramatically improve your landscape for pollinators.

If you determine you'd like to add to the diversity of nectar plants on your property, you then need to decide if you want to add a pollinator meadow, a small garden, plant a nectar-rich hedgerow or add to nectar diversity by adding flowering trees and shrubs (an option often suitable to the slopes of West Virginia). These and other approaches will all require some imagination and planning to maximize your benefits and minimize the effort and maintenance required.

For detailed planting guidance, see our reference section.

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Pollinator meadows can provide an array of pollen and nectar options for pollinators if established and maintained properly.



ONLINE REFERENCES

- Tunnel-nesting bees:** www.xerces.org
- Native bee nests:** www.xerces.org
- Bumble bees:** www.xerces.org
- Butterfly garden plants:** www.wvdnr.gov
- Plants for pollinators:** www.pollinator.org
- West Virginia Pollinator Handbook:** www.xerces.org
- Monarch conservation:** www.pollinator.org
- Planting Guides:** www.xerces.org
- Organic Site Prep:** www.xerces.org
- Gardens:** www.monarchjointventure.org

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